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# FIFTH GRADE.

## REVIEW FOR JANUARY.

HARRIET T. B. ATWOOD.

*Nature study and geography.*— In their study of animal coverings and the fur-trading industry, the children first enumerated, in writing, the kinds of materials commonly used for clothing, keeping those which are intended mainly for warmth in a list by themselves. The lists were read to the class, and, after some discussion, it was decided that silk, wool, down, fur, and, in some cases, feathers, compose the warmest clothing for man. The children's notions as to why these materials are warmer than others, were crude and often very inaccurate. This question was left open until some experiments, to be devised by the children, could be made.

The next point considered was the matter of the natural coverings of animals, and the children wrote a list of these upon the blackboard. For home work they tried to classify the animals with which they were familiar as to their coverings. The children made many mistakes on the question of whether the different animals have fur alone, or only hair, thick fur with little hair, or *vice versa.* We made a trip to the Field Museum to verify these classifications by a study of the animals. The regions from which the animals came were noted, and data collected with regard to coloration of animals living in different environments. The children also sketched some of the animals.

In considering the matter again, the children saw not only that man has adopted practically all of the warmest animal coverings for his winter clothing, but also that he uses no other materials strictly for warmth.

The class then took up a study of furs and visited Marshall Field's fur department, where pelts of all kinds were shown to the children, and the methods of obtaining and preparing them explained. One of the student teachers went also to a tannery, and described her trip to the class.

The children located the regions where the different animals live, and began the study of the animals in their native environment. Topics were assigned for each child to report on, and some library periods were spent in studying the different animals. The children have asked to read some of Ernest Seton-Thompson's stories in class, although they are familiar with most of them.

The plan suggested by the children during the work is to illustrate the industry of fur-trading with pictures, starting with the animals in their native environments. Brief descriptions of the processes which cannot be illustrated will be written. Maps of North America will be drawn, and on these the homes of the animals and the great fur-trading centers can be located.

The experiments to find out what materials conduct heat most readily will be reviewed when the work is completed.

*History.*—The Virginia colony. We began the study of Virginia by taking an imaginary trip to that colony from New England. The date chosen was 1732. Pictures and descriptions of the coastal plain helped the children to appreciate the differences between the rivers of this region and those of New England. Differences in the climate, soil conditions, crops, and occupations of the people were noted, and the scattered plantations contrasted with the villages of New England.

We then made a more detailed study of a Virginia plantation, using pictures of the houses, furniture, spinning rooms, negro cabins, tobacco sheds, wharfs, ocean ships, and river boats owned by the rich planters. We noted differences in the manners and customs of these people and those of New England, and then investigated when and why they had come to America. The children read the stories of Raleigh, Goswold, Captain John Smith, Gates, Yeardley, and Nathaniel Bacon. They read also of the bringing of the first slaves to Virginia, and considered the reasons for the rapid spread of slavery in the South. They investigated the subject of tobacco-raising, reading in this connection chap. xii in Carpenter's *North America* and selections from Tarr and McMurry's *North America.*

While studing the occupations and customs of the people, the children made a special study of the early life of George Washington. They were given the opportunity to plan the morning exercise for February 22, and they have decided to dramatize a school in the time of Washington as a part of the program.

The children are making tiles to be used around a fireplace in the new school building. They are to be made in low relief, and will represent typical scenes in colonial times. A careful sketch of each scene was made on paper before the modeling was attempted.

## REVIEW FOR JANUARY.

### FRANCIS W. PARKER SCHOOL.

### WILLARD STREETER BASS.

*History.*—We first recalled the stories of the founding of the various colonies, studied last quarter, and noticed that the most common unit of colonization was the church congregation, and that very frequently the religious convictions of a pastor and his people made them not only anxious to escape domination in England, but also unwilling to endure restraint even from their own brethren in America. The pupils found in this fact the chief reason for the existence of sixteen separate towns in Massachusetts as early as 1634. They saw that for many reasons these towns would wish to govern themselves. First, the strong desire of the people for religious freedom was of necessity accompanied by a desire for a similar political freedom; second, the people had always exercised a share in the government of the town or parish in which they lived; third, the distance by which they were separated from Boston, and the difficulties of communication, made government from the capital city slow and unsatisfactory. Local self-government was the natural outcome of these circumstances, and the class studied, with some care, the town meeting: who could attend it and vote in it, what powers it had, what officers it chose to carry out its orders, and the questions which it considered.

The industrial life of the New England farm was studied by a careful reading of "Jonathan Dawson," in Jane Andrews's *Ten Boys*.

The class then began the study of Virginia. The love of adventure was a leading motive in founding this colony, and the typical Virginian colonist was studied in the person of that peerless adventurer, Captain John Smith.

*Literature.*—The class studied Longfellow's *Courtship of Miles Standish*. The most of the poem was first read aloud by the teacher, and then the parts which were best liked by the pupils were read by them. In some of the easier parts the first reading was done by the pupils.

*Clay-modeling.*—The class modeled plaques in low relief illustrative of scenes in New England colonial life. Nearly all the children chose a scene from the *Courtship of Miles Standish*.

*Geography.*—In connection with the work in history the class studied characteristic Virginia landscapes from stereopticon and other pictures, and made blackboard drawings of such scenes. It also studied the topography of the south Atlantic states from a sand-modeled map made by the teacher; located the typical landscapes upon it; and finally each pupil modeled such a map.

Our industrial geography in January was the study of coal. By means of stereopticon pictures and reading from Carpenter's *North America*, the class studied the localities in which coal is found and the methods of mining it. When we began to study the distribution of the coal fields of North America, it became apparent that the pupils needed a more definite image of North America as a whole before they could intelligently read a map or understand the commercial significance of coal in a certain location. We therefore spent some time in studying pictures of typical landscapes in various parts of North America, drawing such scenes upon the board, modeling the continent, and making relief maps upon paper (see Ida C. Heffron, *Chalk Modeling*), and locating the various landscapes upon them.

*Nature study.*—A study of coal: We first discussed the formation of coal. The following reasons were given for thinking that coal is formed by the gradual decomposition of wood: (1) coal is like wood in that it will burn; (2) charcoal, which closely resembles mineral coal, is obtained from wood; (3) some pieces of coal show the grain of wood; (4) vegetable matter decaying under water forms a combustible peat at the present time; (5) this peat, with pressure, might become as hard as coal.

The class then undertook a rough analysis of coal in the laboratory. Each pupil was supplied with a common clay pipe, about two feet of rubber tubing, a quart Mason jar, a water tank with a shelf on which the jar could stand, a stand to support the pipe, and a Bunsen burner.

After the experiment, each pupil wrote a description of the way in which he performed it and the results which he observed. The following paper, selected from these descriptions, is printed to show, not only the method of procedure, but also the training which this work gives the pupils in clear thinking and accurate expression. Only three corrections have been made from the first copy of the pupil.

### ANALYSIS OF COAL.

We took some soft coal, just enough to fill an ordinary clay pipe, which was five grams, and put it in a clay pipe. Next we covered the top of the pipe with plaster of Paris. While this was hardening, we filled a glass jar with water. The jar we put into a large pan of water. Now, this pan had from one side to the other a strip of iron about two inches wide. This strip was in the middle of the pan, not across the top. In the strip were three holes, and after the jar was filled with water we set it bottom-side-up on the strip over one of the holes. By this time the plaster had hardened, and we attached a rubber tube to the other end of the pipe. The end of the rubber tube we put into the jar through one of the holes of the shelf. Now, the pipe with the tube on one end of it was screwed into a clamp which held it firmly over a gas flame. The flame heated the bowl of the pipe into which we had put the coal. If any gas wanted to get out, the only possible way was up the tube into the jar. This it did, and as we watched the rubber tube we saw bubbles come out, and gradually the gas took the place of the water. The gas was yellow.

After that, we took the coke out and weighed it. Mine weighed 2.4 grams. The gas was about one-half the weight of the coal.—*Margaret Prussing.*

At the next exercise we noticed the thick black fluid found in our pipe stems and rubber tubing, and the brownish-yellow film on the sides of the jars containing the gas, and on top of the water in them. We called this coal tar. We then examined the gas in our jars and found that it smelled much like the gas supplied to the building from the street, and that it burned in the same way in an ordinary and a Bunsen burner. This naturally raised the question: "Is the gas supplied to the building made in the same way as we made this?"

The answer to this question was postponed until we had burned the coke which we made in the first experiment and weighed the ashes. The burning was done in the same pipes in which the coke had been made, the tops of the pipes being now open.

An excursion was then taken to a gas plant which supplies a large part of the gas used on the North Side. While there, we saw a large plant for making gas from coal by essentially the same process which we had employed in the laboratory. This plant had been abandoned and a method involving much less labor substituted for it. After the trip each member wrote a description of some particular part of the process, and the best descriptions were selected and combined by the class into a single article. The teacher of course assisted in this work, but made no changes in which the class did not concur.

### THE MAKING OF WATER GAS.

(Written by the pupils of the fifth grade.)

Water gas is made from coke and steam. The coke comes from West Virginia. It is made by heating coal and driving the gas out. When they get the coke at the gas works, they put it into wagons, which hold about half a ton. There are big furnaces into which they put the coke. They draw the wagons up to the top of the furnace and let down one side of the wagon, so that the coke can fall into the furnace. Then they light the coke with a torch and force in air so that the coke will burn to a white heat.

When the coke in the furnace is white-hot, they turn off the air and turn on the steam. The steam is made in a boiler and then is heated still hotter. The steam going through the hot coke makes two kinds of gas. These gases will give heat, but no light.

In order to make the gas illuminating it has to go into a carburetor. The carburetor is a chamber with arches running across it. There is a pipe in the top where oil is let in. This runs over the arches. Then the gas is let in. The oil and the gas combine and make illuminating gas.

The gas then goes into a fixer. The fixer is a chamber similar to the carburetor, but it is larger and contains no arches, but white-hot fire brick instead. The gas is here made more permanent and will not change during the rest of the process.

After the gas comes out of the fixer, it goes into a tar extractor. This takes out the tar. It is made up of a tank of water. The gas bubbles through the water and the tar goes to the bottom of the tank.

Then the gas goes through a pipe into a cooler. The cooler is a box with pipes in it. The pipes are filled with cold water. The gas goes between the pipes, and when it comes out its temperature is about 60°.

It has sulphur in it now. If they left the sulphur in, it would bleach all the plants in the room where it was burning and make the air unhealthy to breathe, In order to get the sulphur out the gas has to go through a purifier. The purifier is a box with a layer of sawdust in the bottom to take out the remaining tar. On the top of this is a layer of iron oxide, which takes out the sulphur. Now the gas passes through a meter, which measures how much has been made, and into a storage tank.

When the coke is burned the men take an iron bar about twenty feet long. With this they clean out the furnace and knock the cinders off the sides. Then they have a door under the furnace where they take the ashes out.

The cinders contain a great deal of carbon, and poor people come and get them and use them for fuel.

*Number.*— The class ascertained the price per ton of coal used in the school building, and the quantity used per month, and from these data computed the average cost of heating the building for a day. Some drill problems upon the weight used in selling coal were given at this point.

The class tabulated the results of the analysis of coal in the following form, which is printed in full to show the nature of the number work involved and the accuracy with which the work was done.

The blanks in the table were caused by the pupil losing either his coke before it was burned or a portion of his ashes before they were weighed. In forming judgments of the accuracy of this work, it should be remembered that this is the first these children have done with such a small quantity of material.

ANALYSIS OF SOFT COAL.

| Pupils. | Weights in Grams. | | | | | Per Cents. | | |
|---|---|---|---|---|---|---|---|---|
| | Coal. | Coke. | Gas. | Ashes. | Carbon. | Gas. | Carbon. | Ashes. |
| J. L. | 5 | 3.3 | 1.7 | .6 | 2.7 | 34% | 54% | 12% |
| M. P. | 5 | 2.4 | 2.6 | .5 | 1.9 | 52 | 38 | 10 |
| E. D. | 5 | 3. | 2. | .5 | 2.5 | 40 | 50 | 10 |
| C. H. | 5 | 3. | 2. | .. | ... | 40 | .. | .. |
| L. D. | 5 | 2.8 | 2.2 | .4 | 2.4 | 44 | 48 | 8 |
| D. A. | 5 | 3. | 2. | .. | ... | 40 | .. | .. |
| N. P. | 5 | 3. | 2. | .. | ... | 40 | .. | .. |
| A. H. | 5 | 2.1 | 2.9 | .. | ... | 58 | .. | .. |
| E. B. | 5 | 3. | 2. | .7 | 2.3 | 40 | 46 | 14 |

As this was almost the first serious work which the pupils had done in percentage, and they had not an easy mastery of decimal fractions, the following method was adopted in obtaining the per cents.:

E. D. obtained 2 grams of gas from 5 grams of coal, *i. e.*, $\frac{2}{5}$ (2 fifths) of her coal was gas. $\frac{1}{5} = \frac{20}{100} = 20$ per cent., and $\frac{2}{5} = 2 \times 20$ per cent. $= 40$ per cent., and 40 per cent. of her coal was gas.

J. L. obtained 1.7 grams of gas from 5 grams of coal. $\frac{1.7}{5}$ (1.7 fifths) of his coal was gas. $\frac{1}{5} = 20$ per cent., and $\frac{1.7}{5} = 1.7 \times 20$ per cent. $= 34$ per cent., and 34 per cent. of his coal was gas.

After this work, the reduction of the fractions $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, and $\frac{1}{10}$ to per cents. was taken up, for the purpose of enabling the pupil to handle the more difficult fractions that will occur in another analysis, which the class is just beginning, and ultimately to reduce any fraction to a per cent.

*English composition.*—The reports of the various experiments in the laboratory are made with the primary object of having a clear and accurate record of the work. Every effort is made to have the papers correctly written in the first place; but after the papers have been written they are examined by the teacher, and mistakes are corrected by the pupil. Mistakes made by a considerable number of the pupils are discussed by the whole class, and rules governing such cases are formulated and written down for future use. In the last months several rules for the use of capitals, and the principles of paragraphing, have come up in the work, and have been treated in this manner.

## OUTLINE FOR MARCH.

HARRIET T. B. ATWOOD AND WILLARD STREETER BASS.

*History.*—Story of the founding of the colonies of New York and Pennsylvania; mention and location of the other thirteen colonies. New York will be studied with more care than any other of these colonies on account of its unique geographical situation, and the marked differences between its Dutch colonists and the English of New England and Virginia.

Character of the Dutch; how influenced by the geography of their country. Read selections from *Hans Brinker* and, if time permits, give an account of the siege of Leyden, which vividly illustrates the character of both people and country.

Henry Hudson; story of his voyage in the "Half Moon" and of his subsequent voyages and tragic fate.

Settlement of New Amsterdam. Hudson's River. Study maps to see its importance as gateway to the West. Was there anything in the Dutch saying that England had secured two shells in Virginia and New England, while they had the oyster between them?

Characteristics of the colony. Compare with the English colonies in regard to trade, schools, and political and religious freedom. For customs of the people read *Rip Van Winkle.*

Pennsylvania: The story of its founding; Penn's treaty with the Indians; growth of the colony; customs and occupations of the people, compared with those of the other colonies studied.

REFERENCES: Fiske, *The Dutch and Quaker Colonies in America; The Discovery of the Hudson River*, "Old South Leaflets," No. 94; Motley, *Rise of the Dutch Republic*, Part IV, chap. II; "Old Dutch Times in New York," *Higginson's History.*

For children: Mary Mapes Dodge, *Hans Brinker;* Irving, *Rip Van Winkle;* selections from *Autobiography of Benjamin Franklin.*

*Geography.*—1. Study of the geographical conditions influencing the settlement of New York and Pennsylvania. Study of the Hudson as a type of "drowned" river valley. Experiment in laboratory, showing method of formation of such river valleys. Review: Compare the geographical situations of the Thirteen Colonies and the French settlement in America. Consider how the geography influenced the lives of the settlers previous to the French and Indian war.

2. Distribution of industries in North America (continued): (5) Forestry (see also "Nature Study" below). Distribution of forests in North America. Types of forests and their characteristics. Climatic conditions affecting the development of forests. Influence of forests upon a region; effect of reckless cutting down of forests. Proper care of forests. Regions in North America

where lumbering is an important industry. Methods of felling trees and transporting logs. Methods of sawing logs, seasoning lumber, storing lumber.

If possible, trips will be made to a lumber yard, a furniture factory, or the Pullman car works, and to the Field Museum. Pictures and stereopticon views will be used to illustate methods of lumbering.

REFERENCES: Pinchot, *A Primer of Forestry;* "The Value of Our Trees," *Popular Science Monthly*, Vol. XIX; Shaler, *The Story of Our Continent;* Mill, *The Realm of Nature;* "Forests of the California Coast Range," *Harper's*, Vol. LXXIX, pp. 652–60; Tarr and McMurry, *North America;* Adams, *A Commercial Geography.*

*Nature study.*—1. Study of the landscape: In March the children will mount the paintings made during previous months to form a landscape calendar. Using the weather observations which have been recorded by committees (see October number), they will make their own plan for showing in some graphic way the amount of rainfall and sunshine and the degree of temperature they have noted in the different months.

2. Making of bird calendar to show return of birds: Investigation of the relation between the return of given species and the coming in of new foods; for example, the almost simultaneous reappearance of earthworm and robin.

3. Study of trees: Beginning of growth in stems and buds. Change in color of twigs. Flow of sap. Study composition of sap and productions made from it, *e. g.*, rubber, maple syrup. Tapping of maple tree. Reason for flow of sap; experiment to show root pressure (see Atkinson, *Elementary Botany*, p. 31, and Barnes, *Plant Life*, p. 393). Study of wood and bark. Study of graining and strength of wood (see COURSE OF STUDY, Vol. I, No. 8, p. 745).

REFERENCES: Chapman, *Bird Lore* and *Bird Life;* Neltje Blanchan, *Bird Neighbors;* Herrick, *Home Life of Wild Birds;* Pinchot, *Primer of Forestry;* Tredgold and Tarn, *Carpentry and Joinery;* "Strength of Timber," *Popular Science Monthly*, March, 1873; "Annual Growth," *ibid.*, December, 1883.

*Manual training.*—Making of a small panel of wood on which to mount a painting made for an Easter gift. In connection with the work in woods, each child will choose the wood for his panel, and will then experiment in the shop to find out the best finish for the given specimen.

*Mathematics.*—Calculating the strength of different woods from results of experiments. Determining size of logs which can be cut from trees of given dimensions. Study of board measure. Reducing of recipes needed in the cooking classes (see January number, p. 388).

*French.*—Continue study of French settlement in America. Early in March the children will dramatize the story of "La Salle's Trip down the Mississippi" for morning exercises (see "French" in January number, p. 390).

In addition to the work in history the children will keep a bird calendar in French (see "Nature Study," in this outline).

*Oral reading, dramatic art.*— Irving's *Rip Van Winkle* will be carefully studied and read by the class.

*Music.*— Eleanor Smith, "Pussy Willow's Secret," "The Sap Has Begun to Flow; Grieg, "Come out, Snowwhite Lambkin."

*Home economics.*—Work with cereals continued. Boiling down of maple sap to form maple sugar. The children will tap a maple tree in order to see the flow of sap; but the sap used to make the maple sugar will be sent to the school from a sugar-maple grove in southern Illinois.

*Physical training* (Carl J. Kroh).— Free exercises in class-rooms under direction of student-teachers; practice hours, mornings. Gymnasium practice order: Boys: boxing — positions, attacks, guards, in place. Repetition of mat exercises in connection with facings. Girls: repetition of dancing calisthenics as "double schottische steps." Apparatus gymnastics: free individual practice, special periods, early morning hours (prescribed) — pole- and rope-climbing, swinging on traveling rings, high- and broad-jumping, traveling on horizontal and inclined ladders. Class work on single and double adjustable bars and beams to improve dexterity, form, and skill. Games: "Ladysmith;" "Running the Gauntlet;" outings to lake front.

## SIXTH GRADE.

EDWARD PROKOSCH.

### OUTLINE FOR MARCH (GERMAN).

IN connection with the history work of the class, the animal life, botany, and mineralogy of Greece will be studied in German. For this the following reading-matter will be used:

### THIERLEBEN, PFLANZEN UND MINERALPRODUKTE VON GRIECHENLAND.

Der Boden Griechenlands ist fruchtbar, aber nur ein Sechstel wurde zu Ackerbau verwendet. Fast drei Viertel des Landes dienten nur als Weide. Die Herden bestanden meist aus Ziegen und Schafen. Nur in manchen Gegenden, besonders in Thessalien, gab es auch viele Pferde und Rinder. In den anderen Gegenden wurde viel Wolle gewonnen. Daher standen die Wollspinnerei und Wollfärberei in hoher Blüte. Die Griechen hatten diese beiden Künste und die Metallgiesserei von den Phönikiern gelernt.

Die Jagd brachte reiche Beute an Wild, und zwar nicht nur Hasen, Rehe, Hirsche, sondern es gab auch Eber, Bären, Wölfe